REMARKS/ARGUMENTS

This is a Response to the Office Action mailed September 17, 2004, in which a three (3) month Shortened Statutory Period for Response has been set, due to expire December 17, 2004. Thirty-three (33) claims, including nine (9) independent claims, were paid for in the application. Claims 1, 3, 8-9, 11, 19, 21-22 and 26-28 have been canceled. Claim 14 is currently amended. No new matter has been added to the application. No fee for additional claims is due by way of this Amendment. The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090. Claims 2, 4-7, 10, 12-18, 20, 23-25 and 29-33 are pending.

Objections

Claims 15-16 and 18 were objected to as being dependent on rejected base claim 14. Claim 14 has been amended to recite that the second fuel cell stack threshold voltage is *different* than the first fuel cell stack threshold voltage. The Examiner has noted that the allowability of different threshold voltage values has already been indicated. Office Action mailed September 17, 2004, page 4. Thus, claim 14 as amended is believed to be allowable, as are claims 15 and 16. Claim 18 is dependent on claim 17, the allowability of which is discussed below.

Rejections Under 35 U.S.C. § 102(e)

Claims 2, 4, 6, 14 and 17 were rejected under 35 U.S.C. § 102(e) as being anticipated by Fuglevand et al. (U.S. Patent No. 6,387,556).

The exemplary embodiments of Applicant's invention are discussed generally in the previous amendment, as are the teachings of Fuglevand. In the interest of brevity Applicant will not repeat such, but rather relies on the comments of the previous amendment.

The Examiner quotes Fuglevand for the contention "that the control system can verify that at least one electrical characteristic, such as voltage and/or current, of respective fuel cell cartridges 14 has been reached before closing switching device 38 to couple power bus 60 with an associated load 22." Office Action mailed September 17, 2004, page 4, citing

Fuglevand, col. 7, line 42. The Examiner then concludes that "the reference does in fact teach that an actual voltage measurement is used to control the *switching of the fuel cell to the control system*." Office Action mailed September 17, 2004, page 4 (emphasis added).

Applicant agrees that Fuglevand teaches "that the control system can verify that at least one electrical characteristic, such as voltage and/or current, of respective fuel cell cartridges 14 has been reached before closing switching device 38 to couple power bus 60 with an associated load 22." However, as noted in the sentence immediately following the sentence quoted by the Examiner, the associated load 22 is an *external* load. Fuglevand, col. 7, lines 45-47; also see col. 5, lines 60-64; col. 7, lines 32-44; col. 14, lines 1-9 and lines 51-53. The power supply 32 and hence the battery are *internal* loads. For example, Figure 2 illustrates the power supply internal to the housing 12. Fuglevand, Figure 2. Thus, while Fuglevand teaches that the switching device 38 couples the power bus 60 with a positive terminal 62 and hence an external load 22, it does *not* teach or suggest that the switching device 38 couples the *battery* , which is part of power supply 32, to the *control system* 30. Such a suggestion is conspicuously absent from Fuglevand's description, particularly where describing the operation of the switch control circuitry 33, Fuglevand, col. 13, line 66-col.14, line 53, and where describing the operation of the slave controller 21, Fuglevand, col. 20, line 13-col. 21, line 43. Further, Fuglevand makes clear that the switching device 38 is in series in the power bus 60, and the switching device 38 appears after the connection to the power supply 32 in Figure 2, rendering the switching device incapable of coupling and uncoupling the power supply 32 from the fuel cell stack. Fuglevand, col. 14, lines 1-5, and Figure 2.

Fuglevand goes on teach that the power supply 32 can include a battery powering components during startup. Fuglevand, col. 7, lines 57-58. While Fuglevand notes that the power supply 32 (and hence the battery) can be "coupled" with the power bus 60 during startup, the only specific structure disclosed by Fuglevand for making such a coupling appears to be a direct connection without the use of any switches or active components. Fuglevand, Figure 4. Thus, while Fuglevand teaches that the system may employ power from the fuel cell stack for internal uses, such as for selectively charging a battery of the power supply depending on monitored operations, there is no express teaching or suggestion that the battery is actively

coupled to the control system in response to a particular electrical condition such as stack voltage, and no teaching or suggestion that the battery is ever uncoupled from the control system. Fuglevand, col. 7, lines 60-62; and col. 20, line 4-13. Selective charging of the battery is likely realized via operation of a switch for coupling and uncoupling the battery to, and from, the power bus. Such operation obviously does *not* require that the battery be coupled to, and from, the control system 30 since that battery may simply be coupled in parallel across the appropriate low voltage (*e.g.*, 5VDC) portion of the power supply 32 as suggested by Figure 4.

Rejections Under 35 U.S.C. § 103

Claims 2, 4-7, 14 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuglevand et al. (U.S. Patent No. 6,387,556).

The Examiner states that Fuglevand "does not expressly teach a power supply switch responsive to a stack voltage to couple power from the battery to the control system when the voltage across the stack *falls below* a threshold voltage." Office Action, mailed September 17, 2004, page 3 (emphasis in original). The Examiner suggests that since Fuglevand teaches that battery power is utilized during startup when the fuel cell power is not sufficient, then it would be obvious to one of ordinary skill in the art that it would also be beneficial to decouple the fuel cell during shutdown since its power would not be sufficient to power the control system. Office Action, mailed September 17, 2004, pages 3-4.

Applicant notes that claims 4 and 5 each generally recite a power supply switch responsive to a voltage across the fuel cell stack to couple the fuel cell stack to the fuel cell control system at a first time and coupling the battery to the fuel cell control system at a second time. Similarly, claim 17 generally recites a power supply switch configured to selectively switch power from the fuel cell stack to the microcontroller in a first operating state when a voltage across the fuel cell stack is above a first fuel cell stack threshold voltage and to selectively switch power from a battery to the microcontroller in a second operating state when the voltage across the fuel cell stack is below a second fuel cell stack threshold voltage.

As discussed above, while Fuglevand teaches that a battery may be coupled to provide power to the control system during startup, the switching device 38 described by

Fuglevand is operated to couple an external load to the fuel cell stack via power bus 60, and *not to couple an internal load to the fuel cell stack.*

In arguendo, even if it were obvious that it would also be beneficial to decouple the fuel cell during shutdown since its power would not be sufficient to power the control system, such does not teach or suggest the coupling or uncoupling of the battery from the control system or microcontroller. As explained above, the battery most likely remains coupled to the control system during startup, operation and shutdown since such an approach enhances reliability. For example, if the battery were uncoupled after startup then in the event of a sudden loss of power from the fuel cell stack, there would not be sufficient power to operate the controller and/or switch in order to actively switch the controller back to the battery.

In arguendo, even if the battery were to be disconnected from the fuel cell control system, such would likely require a separate switch from that used to couple and uncouple the fuel cell stack to the control system, and would also likely be different from the switching device 38 (*e.g.*, contactor) used to couple the fuel cell system to the external load. Otherwise, the external load could not be decoupled from the power system without also losing power to the control system.

Conclusion

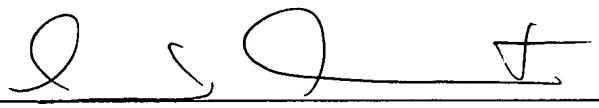
Applicant thanks the Examiner for allowing claims 10, 12-13, 20, 23-25 and 29-33, and for indicating the allowable subject matter of claims 15-16 and 18. Overall, the cited references do not singly, or in any motivated combination, teach or suggest the claimed features of the embodiments recited in independent claims 4-5, 12-14, 17, 20, 23 and 29, and thus such claims are allowable. Because the remaining claims depend from the allowable independent claims, and also because they include additional limitations, such claims are likewise allowable. If the undersigned attorney has overlooked a relevant teaching in any of the references, the Examiner is requested to point out specifically where such teaching may be found.

In light of the above amendments and remarks, Applicant respectfully submits that all pending claims are allowable. Applicant, therefore, respectfully requests that the Examiner reconsider this application and timely allow all pending claims. Examiner Crepeau is

encouraged to contact Mr. Abramonte by telephone to discuss the above and any other distinctions between the claims and the applied references, if desired. If the Examiner notes any informalities in the claims, he is encouraged to contact Mr. Abramonte by telephone to expediently correct such informalities.

Respectfully submitted,

Seed Intellectual Property Law Group PLLC



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